WE CLAIM:

1. A regenerative energy and/or mass exchange assembly, comprising:
   (a) an exchange media;
   (b) a first flow path to pass a fluid stream through the exchange media;
   (c) at least a second flow path to pass a further fluid stream through the exchange media; and
   (d) at least one fluid stream diverter to divert the different flow paths to pass the respective fluid streams through different regions of the exchange media.

2. An exchange assembly according to claim 1 further comprising at least one housing connected to one end of the exchange media and wherein the flow paths are provided in the housing.

3. An exchange assembly according to claim 2 wherein the fluid stream diverter is provided in the housing.

4. An exchange assembly according to claim 3 wherein the housing and the fluid stream diverter cooperate to form the flow paths.

5. An exchange assembly according to claim 4 wherein the fluid stream diverter is rotatably mounted within the housing.

6. An exchange assembly according to claim 5 wherein the exchange media is housed in a plurality of cavities that are separated from one another in cross section and extend in parallel along the direction of fluid stream flow.

7. An exchange assembly according to claim 5 wherein the fluid stream diverter rotates to pass the different fluid streams through the exchange media.

8. An exchange assembly according to claim 6 wherein the fluid stream diverter rotates to pass the different fluid streams through different cavities of the exchange media.

9. An exchange assembly according to claim 7 or 8 further comprising a shaft that extends through the exchange media, the at least one housing connected to one end of the exchange media, and the fluid stream diverter rotatably mounted within the housing.

10. An exchange assembly according to claim 9 wherein the fluid stream diverter has a radial extent that is generally less than the radial extent of the exchange media.

11. An exchange assembly according to claim 10 wherein the at least one housing connected to one end of the exchange media comprises a connection portion and a dispersion portion which are in fluid communication with each other.

12. An exchange assembly according to claim 11 wherein the connection portion has at least two ports adapted to connect to external fluid stream sources.

13. An exchange assembly according to claim 12 wherein the dispersion portion has an open end that is in fluid communication with the exchange media.

14. An exchange assembly according to claim 13 wherein the connection portion has a radial extent that is generally less than the radial extent of the dispersion portion.

15. An exchange assembly according to claim 14 wherein the fluid stream diverter is substantially disposed within the connection portion.

16. An exchange assembly according to claim 15 wherein the fluid stream diverter has a radial extent that is substantially equal to the radial extent of an inner wall of the connection portion.

17. An exchange assembly according to claim 16 wherein the dispersion portion comprises a plurality of chambers that are separated from one another.

18. An exchange assembly according to claim 17 wherein the plurality of cavities that house the exchange media are disposed within a central housing.

19. An exchange assembly according to claim 18 wherein each cavity is thermally insulated from adjacent cavities.

20. An exchange assembly according to claim 19 wherein the plurality of cavities that house the exchange media are positioned in correspondence to the chambers of the dispersion portion.

21. An exchange assembly according to claim 20 wherein the cavities and the chambers are substantially equal in cross section and substantially evenly spaced about the axial direction.

22. An exchange assembly according to claim 21, wherein the number of chambers is three, and the number of cavities is three.

23. An exchange assembly as accordingly to claim 21, wherein the number of chambers is five, and the number of cavities is five.

24. An exchange assembly according to claim 22 or 23, wherein the fluid stream diverter comprises in sequence along the axial direction a first segment, a first reduced diameter portion, a second segment, a second reduced diameter portion, and a third segment; an inner bore defining an inner space within the fluid stream diverter; a first passage extending from a first port in the outer wall of the second reduced diameter portion through the inner space and then to a second port on the outer wall of the first segment; a second passage extending from a third port on the end wall of the first segment adjacent to the first reduced diameter portion to a fourth port on the outer wall of the first segment; and wherein the said first and second passages are isolated from each other.

25. An exchange assembly according to claim 24 wherein sealing means is provided between the fluid stream diverter and the connection portion.

26. An exchange assembly according to claim 25 wherein sealing means is provided between each of the first, second, and third segment, of the fluid stream diverter and the inner wall of the connection portion.

27. An exchange assembly according to claim 26 wherein the connection portion has an open end and a closing means which closes the open end.

28. An exchange assembly according to claim 18 further comprising snap-connection means provided between the central housing and the housing connected to one end of the exchange media.

29. An exchange assembly according to claim 20 wherein the assembly has a first end housing and a second end housing disposed on either end of the exchange media.

30. An exchange assembly according to claim 29 wherein a first fluid stream diverter is disposed in the first end housing and a second fluid stream diverter is disposed within the second end housing.

31. An exchange assembly according to claim 30 wherein the plurality of chambers of the dispersion portion of the first end housing is in substantial axial alignment with the corresponding plurality of chambers of the dispersion portion of the second end housing.

32. An exchange assembly according to claim 31 wherein the first and second fluid stream diverters are disposed correspondingly in the respective end housings and rotate in phase during operation.

33. A method of exchanging energy and/or mass between at least two fluid streams, the method comprising:
    (a) passing at least two fluid streams through different regions of an exchange media;
    (b) changing the flow paths of the fluid streams to the exchange media so that at least one of the fluid streams is passed through a region of the exchange media that a different fluid stream had passed through.

34. A method according to claim 33 wherein each flow path is changed by a fluid stream diverter.

35. A method according to claim 34 wherein the fluid stream diverter is provided in a housing connected to one end of the exchange media.

36. A method according to claim 35 wherein the housing and the fluid stream diverter cooperate to form the flow paths.

37. A method according to claim 36 wherein the fluid stream diverter is rotatably mounted within the housing.

38. A method according to claim 37 wherein the exchange media is housed in a plurality of cavities that are separated from one another in cross section and extend in parallel along the direction of fluid stream flow.

39. A method according to claim 37 wherein the fluid stream diverter rotates to pass the different fluid streams through the exchange media.

40. A method according to claim 37 wherein the fluid stream diverter rotates to pass the different fluid streams through different cavities of the exchange media.

41. A method according to claim 37 wherein in step (a) passing the fluid streams through different regions of an exchange media is in a concurrent direction.

42. A method according to claim 37 wherein in step (a) passing the fluid streams through different regions of an exchange media is in a counter-current direction.